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Capability of applying morphometric parameters of relief in river basins for geomorphological zoning of a territory

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Abstract

© Published under licence by IOP Publishing Ltd. Information about morphometric characteristics of relief is necessary for researches devoted to geographic characteristics of territory, its zoning, assessment of erosion processes, geoecological condition and others. For the Volga Federal District for the first time a spatial database of geomorphometric parameters 1: 200 000 scale was created, based on a river basin approach. Watersheds are used as a spatial units created by semi-automated method using the terrain and hydrological modeling techniques implemented in the TAS GIS and WhiteBox GIS. As input data DEMs SRTM and Aster GDEM and hydrographic network vectorized from topographic maps were used. Using DEM highlighted above for each river basin, basic morphometric relief characteristics such as mean height, slope steepness, slope length, height range, river network density and factor LS were calculated. Basins belonging to the geomorphological regions and landscape zones was determined, according to the map of geomorphological zoning and landscape map. Analysis of variance revealed a statistically significant relationship between these characteristics and geomorphological regions and landscape zones. Consequently, spatial trends of changes of analyzed morphometric characteristics were revealed.

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